**ELECTROCHEMICAL GENERATION OF FERRATE.**

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Ferrate is an iron species in an unusual valence state (greater than 3) and therefore a very powerful oxidizing agent that has been considered for several applications (1-3). Ferrate can be used as an oxidant : i) in organic synthesis as a substitute and safer alternative to other highly toxic oxidizing compounds (eg. $CrO_3$, $K_2Cr_2O_7$) and ii) for the destruction of organics and for water treatment to replace chlorine, hydrogen peroxide or ozone. Ferrate has been recently used in a new class of batteries, referred to as super-iron batteries, which use the Fe(VI)/Fe(III) system as cathode material in alkaline (with a zinc anode).

Ferrate can be chemically and electrochemically synthesized. The chemical synthesis involves the oxidative treatment of $Fe(NO_3)_3$ with an oxidant such as alkaline hypochlorite. On the other hand, ferrate can be electrochemically generated by oxidation of an iron electrode in alkaline media according to the overall reaction :

$$Fe + 4\ OH^- \text{----->}\ FeO_4^{2-} + 4\ H^+ + 6\ e^-$$

Unfortunately, the electrochemical method suffers from a significant decrease of the generation yield which is thought to be due to the formation of a passivation layer. Thus, the development of new experimental approaches to maintain a high generation yield are mandatory to insure the viability of the electrochemical approach.

This work focuses on the development of experimental procedures to generate ferrate in high yield (without loss of faradaic efficiency with time of electrolysis).

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